Honors Math II
Chapter 10 day 4

Name Key
Period _____ Date _____

Compound Probabilities:

A card is randomly selected from a standard deck of 52 cards. Find the probability of drawing the given card.

1. An ace or an eight

Ace Eight
4 4

$\frac{4}{52} + \frac{4}{52} = \frac{8}{52}$

$\frac{8}{52} = \boxed{\frac{2}{13}}$

2. A 10 or a diamond

10 Diamond
3 1 12

$\frac{3}{52} + \frac{13}{52} - \frac{1}{52}$

$\frac{16}{52} = \boxed{\frac{4}{13}}$

3. A king and a diamond

King Diamond
3 1 12

$= \boxed{\frac{1}{52}}$

4. A king or a diamond

K D
3 1 12

$\frac{16}{52} = \boxed{\frac{4}{13}}$

$\frac{4}{52} + \frac{13}{52} - \frac{1}{52} = \frac{16}{52}$

5. A spade or a club

Spade club
13 13

$\frac{26}{52} = \boxed{\frac{1}{2}}$

6. A 4 or a 5

4 5
4 4

$\frac{8}{52} = \boxed{\frac{2}{13}}$

7. A 6 and a face card

6 face
4 12

$= \boxed{0}$

8. Not a heart

H NH
13 39

$\frac{39}{52} = \boxed{\frac{3}{4}}$

9. You are performing an experiment to determine how well plants grow under different light sources. Out of the 30 plants in the experiment, 12 receive visible light, 15 receive ultraviolet light, and 6 receive both visible and ultraviolet light. What is the probability that a plant in the experiment recives either visible light or ultraviolet light?

VL UL
6 6 9

$\frac{21}{30} = .7$

or $\frac{12}{30} + \frac{15}{30} - \frac{6}{30} = \frac{21}{30}$

10. You and your best friend are among several candidates running for class president. You estimate that there is a 45% chance you will win and a 25% chance your best friend will. What is the probability that either you or your best friend win the election?

$(.45) + (.25) = .7$

Probabilities of Independent and Dependent events:

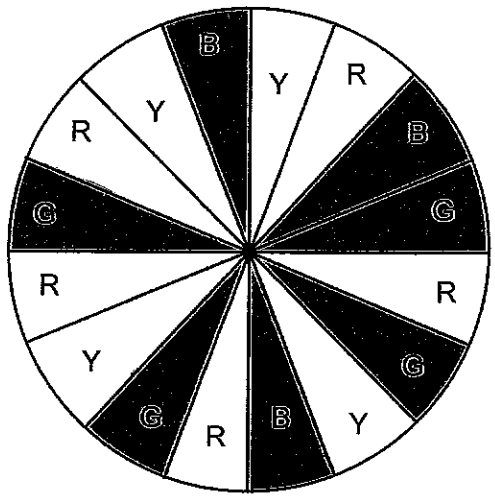
You are playing a game that involves spinning the wheel shown. Find the probability of spinning the given colors. (Assume that each pie piece is equally spaced)

Y = Yellow

R = Red

B = Blue

G = Green



11. green, then blue

$\frac{4}{16} \cdot \frac{3}{16} = \frac{3}{64} \approx .0468$

12. red, then yellow

$\frac{5}{16} \cdot \frac{4}{16} = \frac{5}{64} \approx .0781$

13. blue, then red

$\frac{3}{16} \cdot \frac{5}{16} = \frac{15}{256} \approx .0585$

14. yellow, then green

$\frac{4}{16} \cdot \frac{4}{16} = \frac{1}{16} \approx .0625$

15. blue, then green, then red

$\frac{3}{16} \cdot \frac{4}{16} \cdot \frac{5}{16} = \frac{15}{1024} \approx .0146$

16. green, then red, then yellow

$\frac{4}{16} \cdot \frac{5}{16} \cdot \frac{4}{16} = \frac{5}{256} \approx .0195$

17. Is spinning a spinner considered independent or dependent events?

independent

Find the probability of drawing the given cards from a standard deck of 52 cards (a) with replacement and (b) without replacement.

18. A club, then a spade

a) $\frac{13}{52} \cdot \frac{13}{52} = \frac{1}{16}$ b) $\frac{13}{52} \cdot \frac{13}{51} = \frac{13}{204}$

19. A queen , then an ace

a) $\frac{4}{52} \cdot \frac{4}{52} = \frac{1}{169}$ b) $\frac{4}{52} \cdot \frac{4}{51} = \frac{4}{663}$

20. A face card, then a 6

a) $\frac{12}{52} \cdot \frac{4}{52} = \frac{3}{169}$ b) $\frac{12}{52} \cdot \frac{4}{51} = \frac{4}{221}$

21. A 10, than a 2

a) $\frac{4}{52} \cdot \frac{4}{52} = \frac{1}{169}$ b) $\frac{4}{52} \cdot \frac{4}{51} = \frac{4}{663}$

22. A king, then a queen, then a jack

a) $\frac{4}{52} \cdot \frac{4}{52} \cdot \frac{4}{52} = \frac{1}{2197}$ b) $\frac{4}{52} \cdot \frac{4}{51} \cdot \frac{4}{50} = \frac{8}{16575}$

23. A spade, then a club, then another spade

a) $\frac{13}{52} \cdot \frac{13}{52} \cdot \frac{13}{52} = \frac{1}{64}$ b) $\frac{13}{52} \cdot \frac{13}{51} \cdot \frac{12}{50} = \frac{13}{850}$

24. Events A and B are independent. What is P(A and B) if P(A) = .3 and P(B) = .2 ?

$(.3)(.2) = .06$

25. A drawer contains 10 red socks, 6 white socks, and 8 blue socks. Without looking, you draw out a sock, return it, and draw out a second sock. What is the probability that the first ~~block~~ sock is blue and the second sock is white?

$\frac{8}{24} \cdot \frac{6}{24} = \frac{1}{12}$

26. A coin is tossed and a die is rolled. What is the probability tht the coin shows tails and the die shows 2?

$\frac{1}{2} \cdot \frac{1}{6} = \frac{1}{12}$

27. A bag contains 3 red marbles and 5 purple marbles. One marble is drawn at random and not replaced. Then a second marble is drawn at random. What is the probability that the first marble is purple and the second marble is red?

$\frac{5}{8} \cdot \frac{3}{7} = \frac{15}{56}$

28. Two jars each contain green balls and black balls. Jar 1 contains 4 green balls and 6 black balls and jar 2 contains 5 green balls and three black balls. A ball is drawn from each jar at random. What is the probability that both balls are black?

$\frac{6}{10} \cdot \frac{3}{8} = \frac{9}{40}$

29. A drawer contains 6 red socks, 5 white socks, and 9 blue socks. Without looking, you draw out a sock and then draw out a second sock without returning the first sock. What is the probability that the first sock and the second sock are both red?

$\frac{6}{20} \cdot \frac{5}{19} = \frac{3}{38}$

Tell whether the events are independent or dependent. Then answer the question.

30. A drawer contains 9 black socks, 8 gray socks, and 7 blue socks. Without looking, you draw out a sock and then draw out a second sock without returning the first sock. What is the probability that the two socks you draw are the same color? dependent

2 black 2 gray 2 blue

$\frac{9}{24} \cdot \frac{8}{23} + \frac{8}{24} \cdot \frac{7}{23} + \frac{7}{24} \cdot \frac{6}{23} = \frac{85}{276} \approx .3079$

31. A laundry bag contains 4 brown socks and 7 black socks. Find the probability of picking a brown sock first, followed by a black sock, if the first sock in not returned to the bag before the second sock is picked.

$\frac{4}{11} \cdot \frac{7}{10} = \frac{14}{55}$ dependent

32. A bag contains 6 orange, 7 green, and 8 yellow marbles. Find the probability of picking 3 yellow marbles if each marble is returned to the bag before the next marble is picked. independent

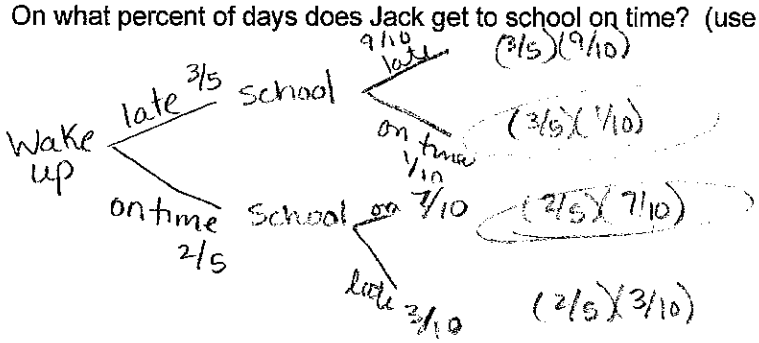
$\frac{8}{21} \cdot \frac{8}{21} \cdot \frac{8}{21} = \frac{512}{9261} \approx .055$

33. Jake wakes up late on average 3 days in every 5.

If Jack wakes up late, the probability he is late for school = 9/10.

If Jack does not wake up late, the probability he's late for school = 3/10.

On what percent of days does Jack get to school on time? (use a tree diagram)



$\frac{3}{50} + \frac{14}{50} = \frac{17}{50} = .34$

34%

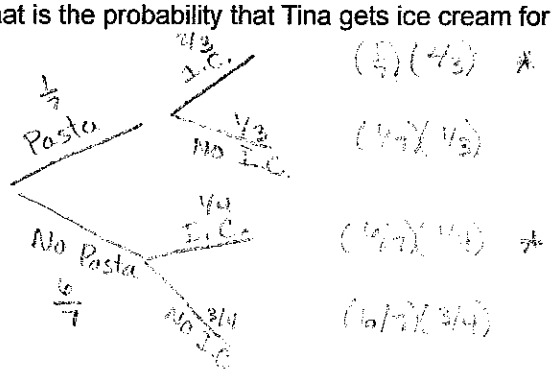
34. Tina's favorite meal is pasta, followed by ice cream for dessert.

Tina's Mom cooks pasta once a week.

If she cooks pasta, then the probability Tina gets ice cream for dessert = 2/3.

If she doesn't cook pasta, then the probability Tina gets ice cream for dessert is 1/4.

What is the probability that Tina gets ice cream for dessert? (make a tree diagram)

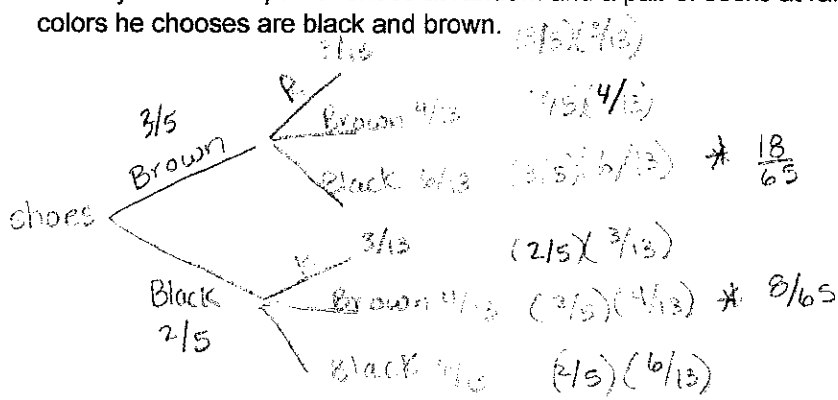


$\frac{2}{21} + \frac{6}{28} =$ .3095

35. Teddy has two pairs of black shoes and three pairs of brown shoes.

He also has three pairs of red socks, four pairs of brown socks, and six pairs of black socks.

If Teddy chooses a pair of shoes at random and a pair of socks at random, what is the probability that the colors he chooses are black and brown.



$\frac{18}{65} + \frac{8}{65} = \frac{26}{65} = \frac{2}{5}$